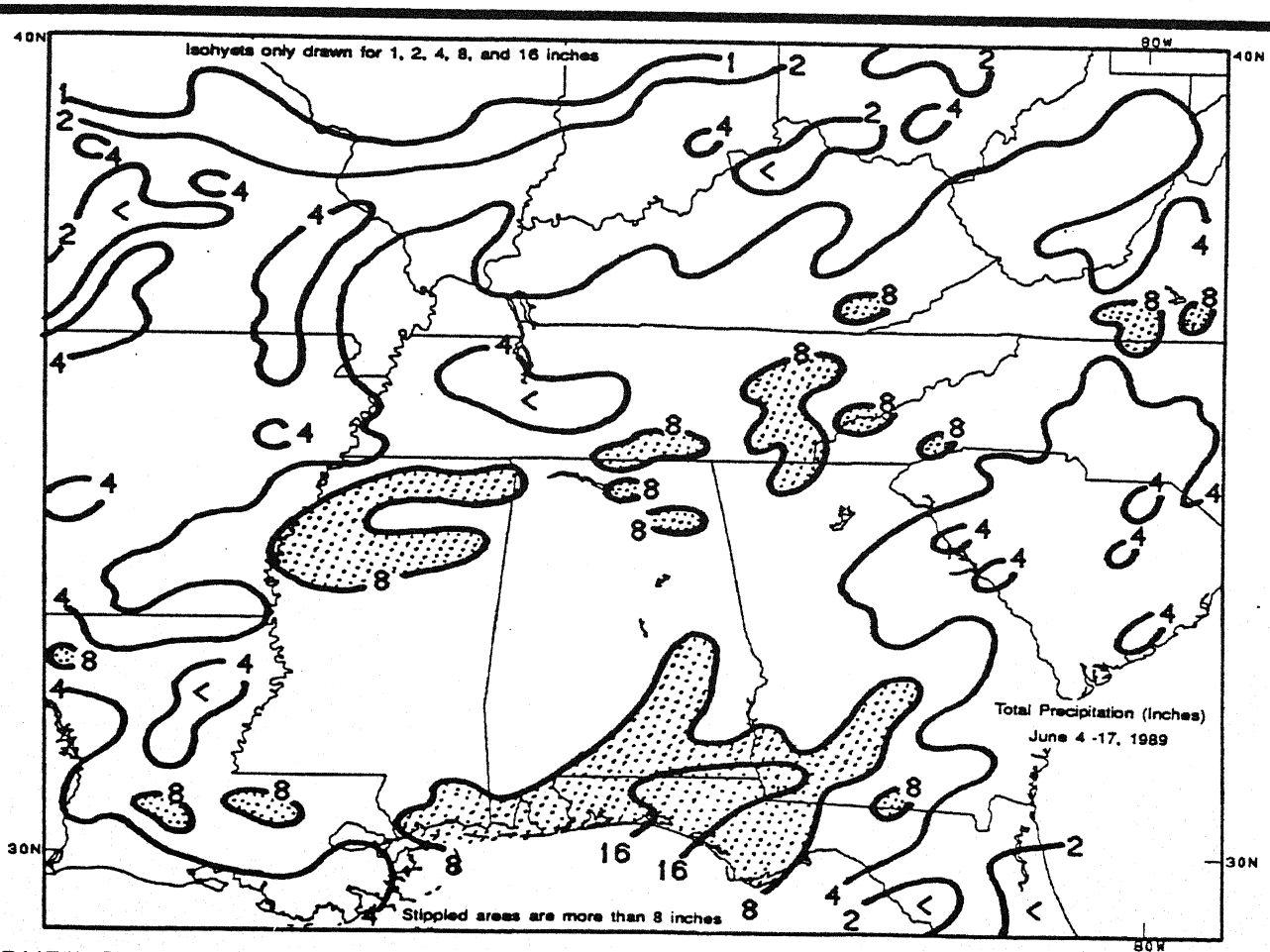
CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

No. 89/24 **Washington, DC** **June 17, 1989**



DURING THE PAST TWO WEEKS, NUMEROUS SHOWERS AND THUNDERSTORMS HAVE DRENCHED MOST OF THE SOUTHEAST AND GULF COAST. MANY AREAS OF THE U.S. THAT WERE AFFLICTED WITH SEVERE DRYNESS LAST YEAR (APRIL-JUNE) HAVE RECORDED NEAR TO ABOVE NORMAL PRECIPITATION DURING THE SAME TIME PERIOD THIS YEAR. FOR A COMPARISON OF 1988 VERSUS 1989 SPRING PRECIPITATION, REFER TO THE U.S. WEEKLY CLIMATE HIGHLIGHTS.

UNITED STATES DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL WEATHER SERVICE - NATIONAL METEOROLOGICAL CENTER

WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief, concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- Highlights of major climatic events and anomalies.
- U.S. climatic conditions for the previous week.
- U.S. apparent temperatures (summer) or wind chill (winter).
- Global two-week temperature anomalies.
- Global four-week precipitation anomalies.
- Global monthly temperature and precipitation anomalies.
- Global three-month precipitation anomalies (once a month).
- Global twelve-month precipitation anomalies (every 3 months).
- Global three month temperature anomalies for winter and summer seasons.
- Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Center via the Global Telecommunication System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF JUNE 17, 1989

1. North-Central United States:

REGION CONTINUES DRY.

Even though recent rainfall was widespread, amounts of 5 to 15 mm (with a maximum of 26 mm) were inadequate to ease long-term precipitation deficits in the area [13 weeks].

2. Eastern United States:

SOILS REMAIN SATURATED.

The abundant rains that soaked the region in May have continued into June as totals approached 135 mm at some locations [7 weeks].

3. Southern Great Plains and Gulf Coast:

EXCESSIVE PRECIPITATION PERSISTS.

Flooding was a common problem as slow moving storms dumped up to 246 mm of rain over stations that have received copious amounts in previous weeks [5 weeks].

4. Eastern Mexico:

EXTREME HEAT DIMINISHES.

Temperatures continued to average above normal, however, maximum departures of +3°C were considerably below those experienced during recent weeks [5 weeks].

5. Southeastern Brazil:

HEAVY RAINS FALL IN RIO.

Portions of Sao Paulo and Rio de Janeiro experienced local flooding as up to 241 mm of rain was measured [Episodic Event].

6. Sahelian West Africa:

HOT CONDITIONS SUBSIDE.

Even though daytime maximums approached 44°C at one location, temperatures returned to more seasonable levels as the greatest departure from normal was only +3°C [7 weeks].

7. Turkey:

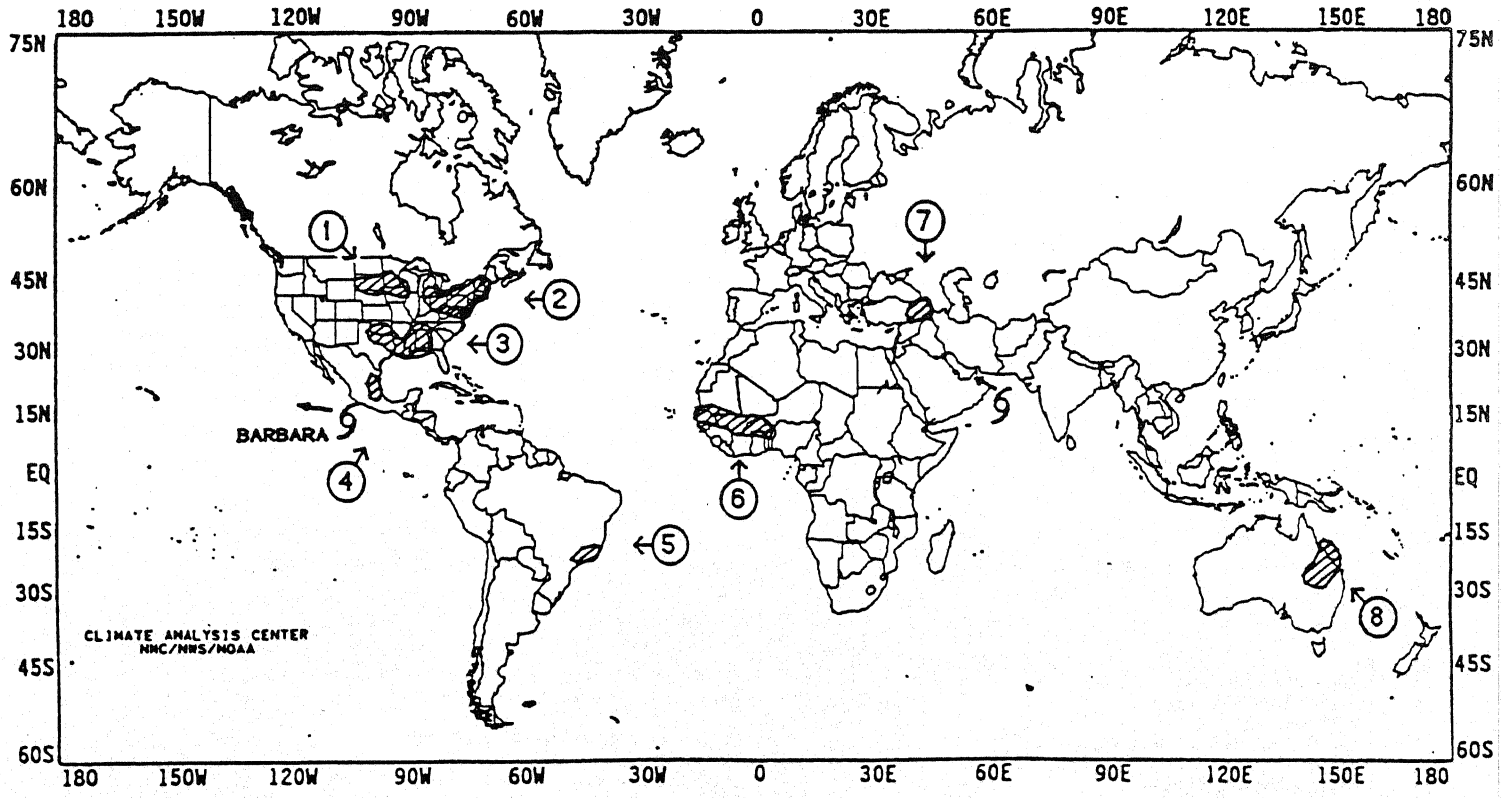
DRYNESS EASES.

Moderate rainfall (15 to 25 mm) in recent weeks, coupled with a normal seasonal decline in precipitation, has alleviated the anomalously dry conditions that formerly prevailed [Ended at 13 weeks].

8. Eastern Australia:

FAVORABLE DRYNESS RETURNS TO AREA.

Precipitation amounts of less than 5 mm provided a welcome relief from the excessive autumn rainfall [14 weeks].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF JUNE 11 THROUGH JUNE 17, 1989.

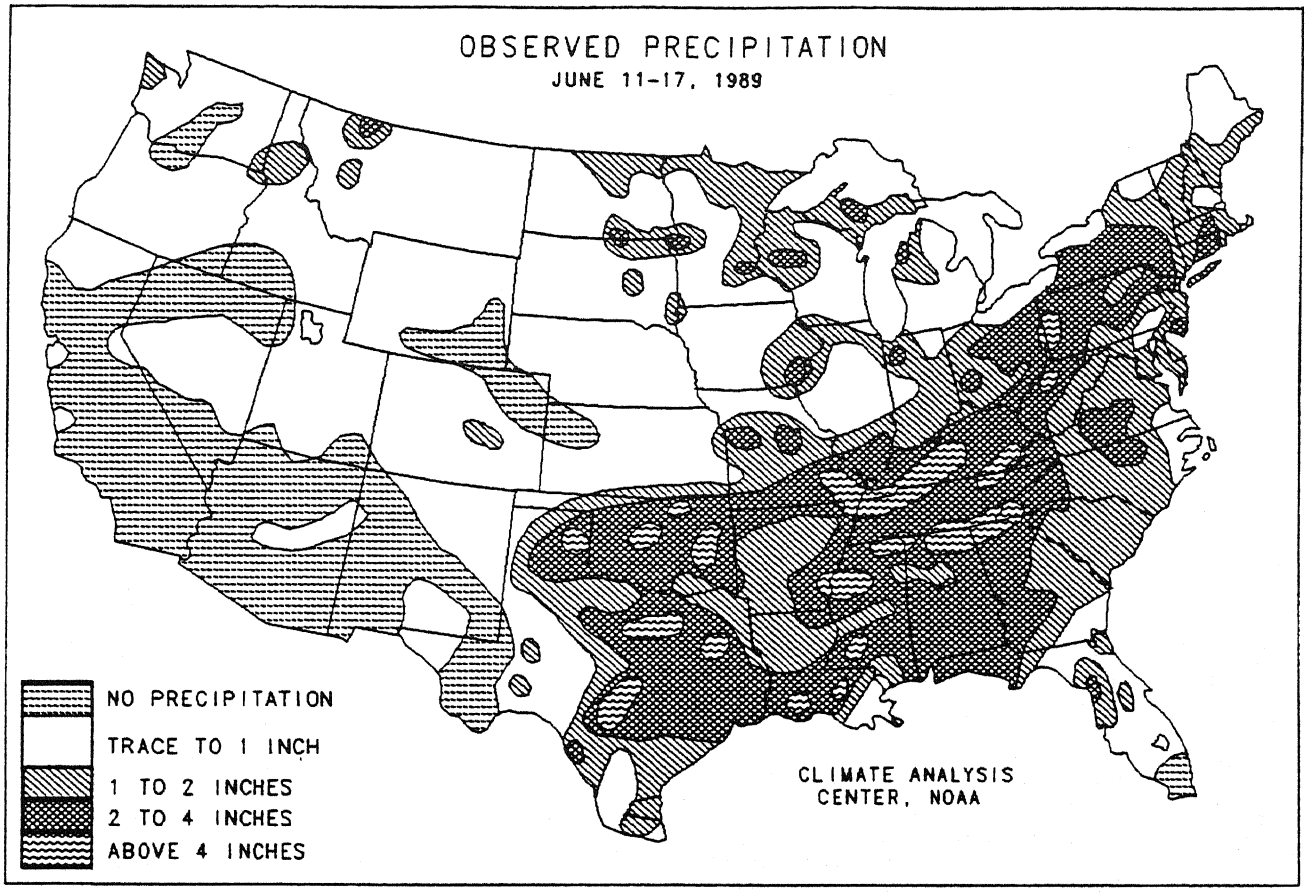
In a near-duplication of last week, most of the Gulf Coast, Southeast, Atlantic Seaboard, and south-central Great Plains observed numerous thunderstorms and heavy precipitation, the latter area for the seventh week out of the past eight. Early in the week, a warm front located over the central Great Plains slowly moved northward, triggering severe weather across much of the nation's midsection. South of the front in the warm air, the combination of an upper-air disturbance and moist Gulf flow produced strong thunderstorms that caused flooding in parts of Oklahoma and northeastern Texas. During the first two weeks of June, more than 8.6 inches of rain have fallen on Wichita Falls, TX, already the second highest June total on record. By mid-week, the area of severe weather slowly shifted southward and eastward in association with a slow-moving cold front. Many locations in the Ohio Valley, mid-Atlantic, Southeast, and along the Gulf Coast experienced intense thunderstorms containing heavy downpours, damaging winds, large hail, and tornadoes. As the front stalled over the Appalachians, plentiful showers and thunderstorms continued throughout most of the Atlantic Seaboard during the latter half of the week. In the West, a cold front generally brought light precipitation to parts of the Pacific Northwest, northern Rockies, and northern Great Plains with the exception of northern Idaho, northwestern Montana, and northern North Dakota where more than an inch of rain fell.

For the second consecutive week, torrential rains inundated portions of northwestern Florida, southern Alabama and Georgia, and northern Mississippi. Two-week totals in these areas ranged between 8 and 22 inches, according to the River Forecast Centers [RFC] (see front cover). Similarly, some RFC stations in the south-central Great Plains, most notably in north-central Texas and central Oklahoma, have measured more than two feet of rain since late April. In addition to these areas, most of the lower Missouri, Tennessee, and lower Ohio Valleys as well as the Appalachians received heavy precipitation last week (see Table 1). After an abnormally dry Winter and early Spring, most of the Northeast has reported much above normal precipitation during the past 7 weeks. Elsewhere, heavy amounts occurred in west-central Florida, northern North Dakota, central Minnesota, and in parts of the western Great Lakes. Light to moderate totals were recorded along the southeastern Alaskan and northern two-thirds of the Pacific Coasts, in the Pacific Northwest, and throughout most of the nation east of the Continental Divide. Little or no precipitation fell along the southern third of the Pacific Coast, on the Great Basin, desert Southwest, southern Rockies, upper half of the Rio Grande Valley, central High Plains, and in eastern Florida.

Extremely hot weather returned to the Southwest last week as temperatures averaged between 6°F and 9°F above normal from central Arizona and southern California northward into southern Idaho (see Table 2). Highs of 110°F or more were common in the desert Southwest (120°F at Death Valley, CA on June 14), while readings in the one hundreds occurred in the interior California valleys, southern New Mexico, southwestern Texas, and in western South Dakota and Nebraska (see Figure 1). Above normal weekly temperatures also prevailed across the western third of the U.S. and along the eastern Gulf and southern half of the Atlantic Coasts. In sharp contrast, unseasonably cool conditions covered much of the nation east of the Rockies and west of the Appalachians, along with New England (see Table 3) The greatest negative temperature departures (between -8°F and -10°F) were located in the central Great Plains, middle Mississippi Valley, and upper Midwest Dozens of stations tied or set new daily minimum temperatures records during the week as lows dipped into the thirties and forties throughout the nation's midsection (see Figure 2). Weekly temperatures averaged near normal in both Alaska and Hawaii.

TABLE 1. Selected stations with 3.50 or more inches of precipitation for the week.

STATION	TOTAL (INCHES)	STATION	TOTAL (INCHES)
GREENWOOD, MS	7.90	BOWLING GREEN, KY	4.16
MONTGOMERY, AL	7.46	SAN ANTONIO/KELLY AFB, TX	4.15
PENSACOLA, FL	6.99	HUNTSVILLE, AL	4.13
MILTON/WHITING NAS, FL	6.10	KILLEEN/ROBERT GRAY AAF, TX	4.01
MONTGOMERY/MAXWELL AFB, AL	5.84	CHARLESTON, WV	3.99
OKLAHOMA CITY, OK	5.73	MUSCLE SHOALS, AL	3.97
CAPE GIRARDEAU, MO	5.23	BATON ROUGE, LA	3.96
PITTSBURGH, PA	4.64	JACKSON, TN	3.75
PANAMA CITY/TYNDALL AFB, FL	4.57	NASHVILLE, TN	3.70
MCALESTER, OK	4.45	HOPKINSVILLE/CAMPBELL AFB, TN	3.65
BLYTHEVILLE AFB, AR	4.38	ATLANTA, GA	3.60
MT. WASHINGTON, NH	4.35	ALBANY, GA	3.59
FT WORTH/MEACHAM, TX	4.28	DAYTON/WRIGHT-PATERSON AFB, OH	3.59
CRESTVIEW, FL	4.20	SAN ANTONIO/RANDOLPH AFB, TX	3.59
FT WORTH/CARSWELL AFB, TX	4.18		


OBSERVED PRECIPITATION
JUNE 11-17, 1989
NO PRECIPITATION
TRACE TO 1 INCH
1 TO 2 INCHES
2 TO 4 INCHES
ABOVE 4 INCHES
CLIMATE ANALYSIS
CENTER, NOAA

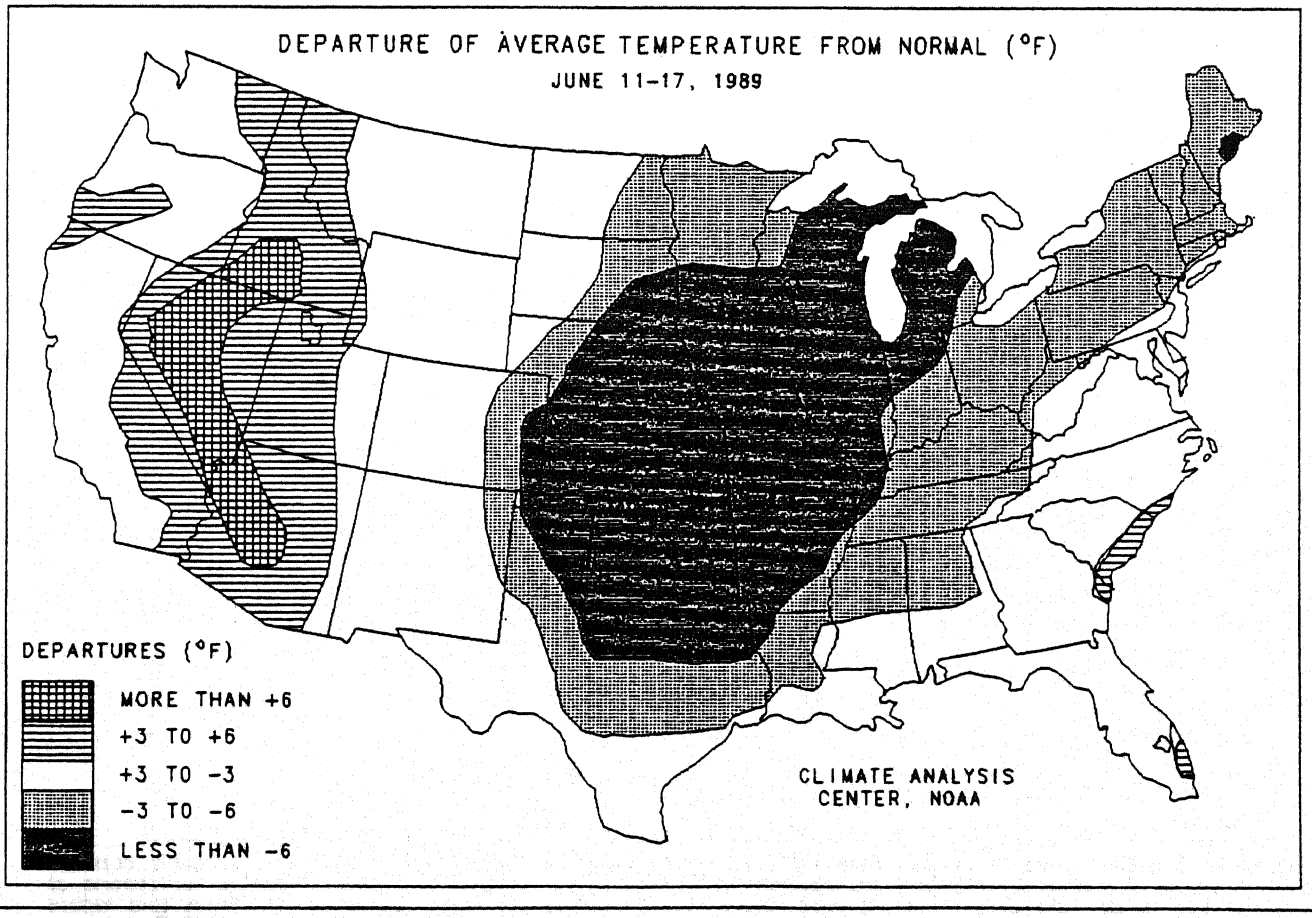

DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)
JUNE 11-17, 1989
DEPARTURES (°F)
MORE THAN +6
+3 TO +6
+3 TO -3
-3 TO -6
LESS THAN -6
CLIMATE ANALYSIS
CENTER, NOAA

TABLE 2. Selected stations with temperatures averaging 3.5°F or more ABOVE normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
VICTORVILLE/GEORGE AFB, CA	+9.1	80.1	OGDEN/HILL AFB, UT	+4.9	70.9
PHOENIX, AZ	+8.5	94.8	ELY, NV	+4.3	62.8
PRESCOTT, AZ	+8.4	74.8	CEDAR CITY, UT	+4.1	70.1
GLENDALE/LUKE AFB, AZ	+7.2	91.4	REDMOND, OR	+4.1	62.3
RENO, NV	+7.1	69.1	TUCSON, AZ	+4.0	86.9
LOVELOCK, NV	+6.9	73.4	IMPERIAL, CA	+3.8	89.3
WINNEMUCCA, NV	+6.5	69.4	SAVANNAH, GA	+3.8	82.3
BOISE, ID	+6.1	71.4	DELTA, UT	+3.8	70.5
LAS VEGAS, NV	+6.0	89.3	MIAMI, FL	+3.7	84.6
BURLEY, ID	+5.9	68.0	CHARLESTON, SC	+3.7	81.1
SALT LAKE CITY, UT	+5.4	72.8	WEST PALM BEACH, FL	+3.6	84.1
PASO ROBLES, CA	+5.1	73.6	BLYTHE, CA	+3.5	91.7
ELKO, NV	+5.0	65.6	FRESNO, CA	+3.5	78.2
YUMA, AZ	+4.9	91.8			

TABLE 3. Selected stations with temperatures averaging 7.0°F or more BELOW normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
SPRINGFIELD, MO	-10.1	63.1	FT. SILL/HENRY POST AAF, OK	-7.6	71.2
JOPLIN, MO	-9.7	65.3	NORTH OMAHA, NE	-7.5	65.1
HARRISON, AR	-9.2	64.8	KANSAS CITY/MUNI., MO	-7.5	68.2
GARDEN CITY, KS	-9.1	65.1	LA CROSSE, WI	-7.4	61.0
PARK FALLS, WI	-9.0	53.3	SPRINGFIELD, IL	-7.4	65.4
ROCHESTER, MN	-9.0	57.6	WICHITA, KS	-7.4	68.5
COLUMBIA, MO	-8.8	64.6	EAU CLAIRE, WI	-7.3	58.5
GAGE, OK	-8.7	67.8	NORFOLK, NE	-7.3	63.2
SPENCER, IA	-8.3	60.1	TULSA, OK	-7.3	70.1
MARQUETTE, MI	-8.2	51.2	ABILENE, TX	-7.3	73.0
WICHITA FALLS, TX	-8.2	72.4	WEST PLAINS, MO	-7.2	65.6
WAUSAU, WI	-8.0	56.4	HOUGHTON LAKE, MI	-7.1	55.6
FAYETTEVILLE, AR	-8.0	65.4	MOLINE, IL	-7.1	63.9
DODGE CITY, KS	-8.0	66.4	RUSSELL, KS	-7.1	67.1
KANSAS CITY/INTL., MO	-7.9	66.9	AMARILLO, TX	-7.1	67.6
CHANUTE, KS	-7.8	67.0	BELLEVILLE/SCOTT AFB, IL	-7.1	68.2
HOBART, OK	-7.8	71.0	JONESBORO, AR	-7.1	70.7
DALLAS/FORT WORTH, TX	-7.8	73.4	SIOUX CITY, IA	-7.0	63.8
BURLINGTON, IA	-7.7	63.8	LITTLE ROCK, AR	-7.0	71.5
BLYTHEVILLE AFB, AR	-7.7	70.4			

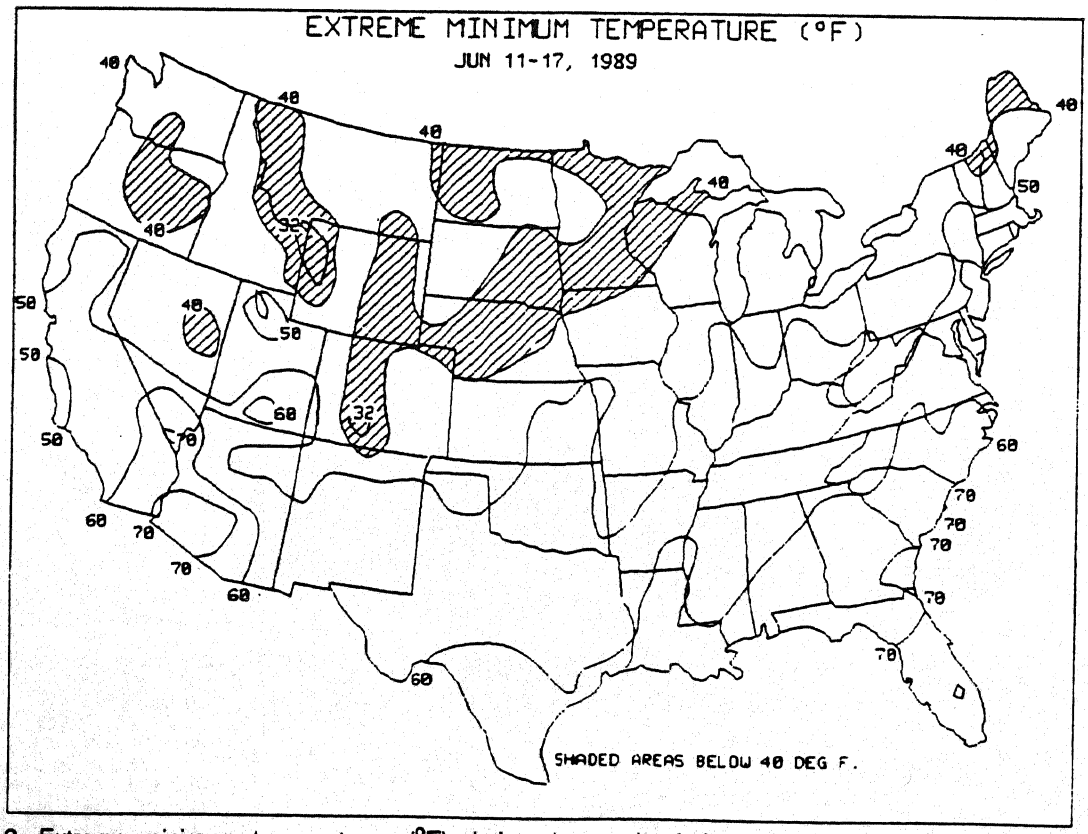


Figure 2. Extreme minimum temperatures (°F) during the week of June 11-17, 1989. Unseasonably cool air from Canada dipped southward into the northern and central Great Plains and upper Midwest as dozens of stations tied or set new daily minimum temperature records during the week. Lows in the thirties and forties were common in the north-central U.S. while readings in the fifties reached to the western Gulf Coast.

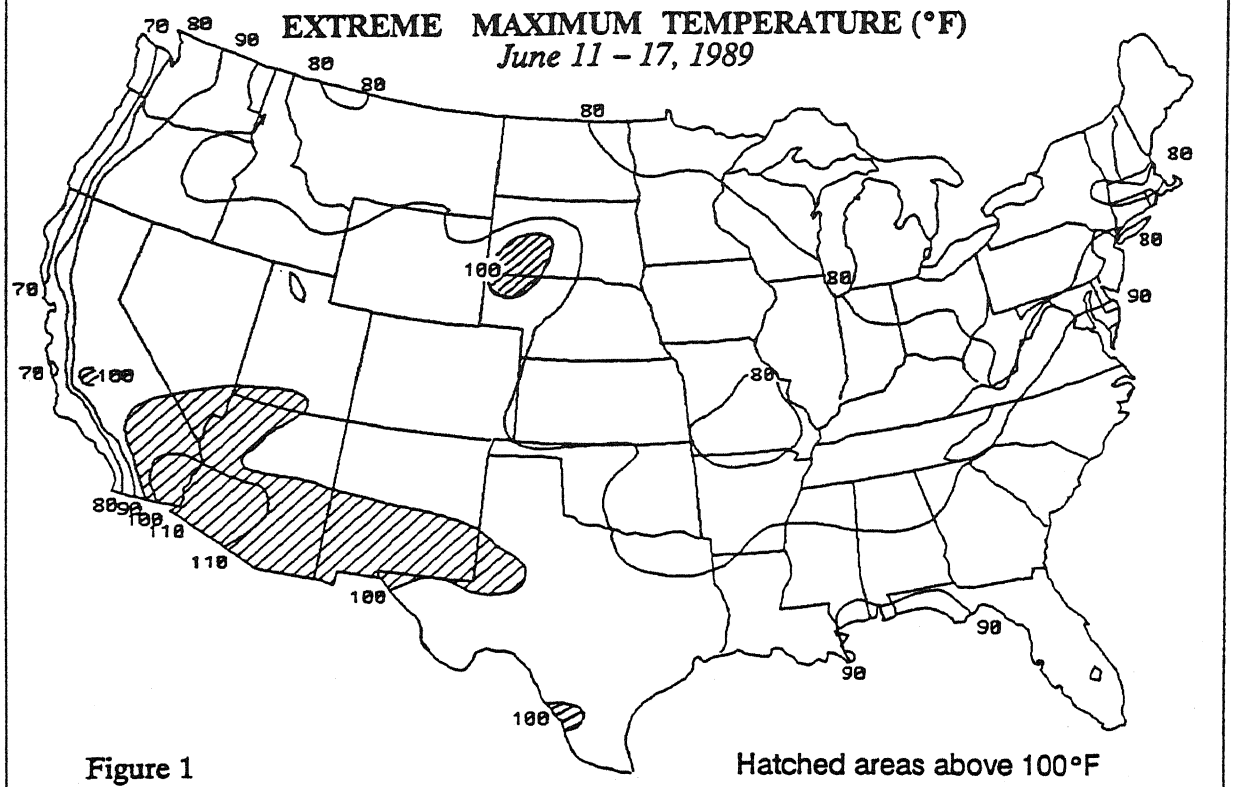
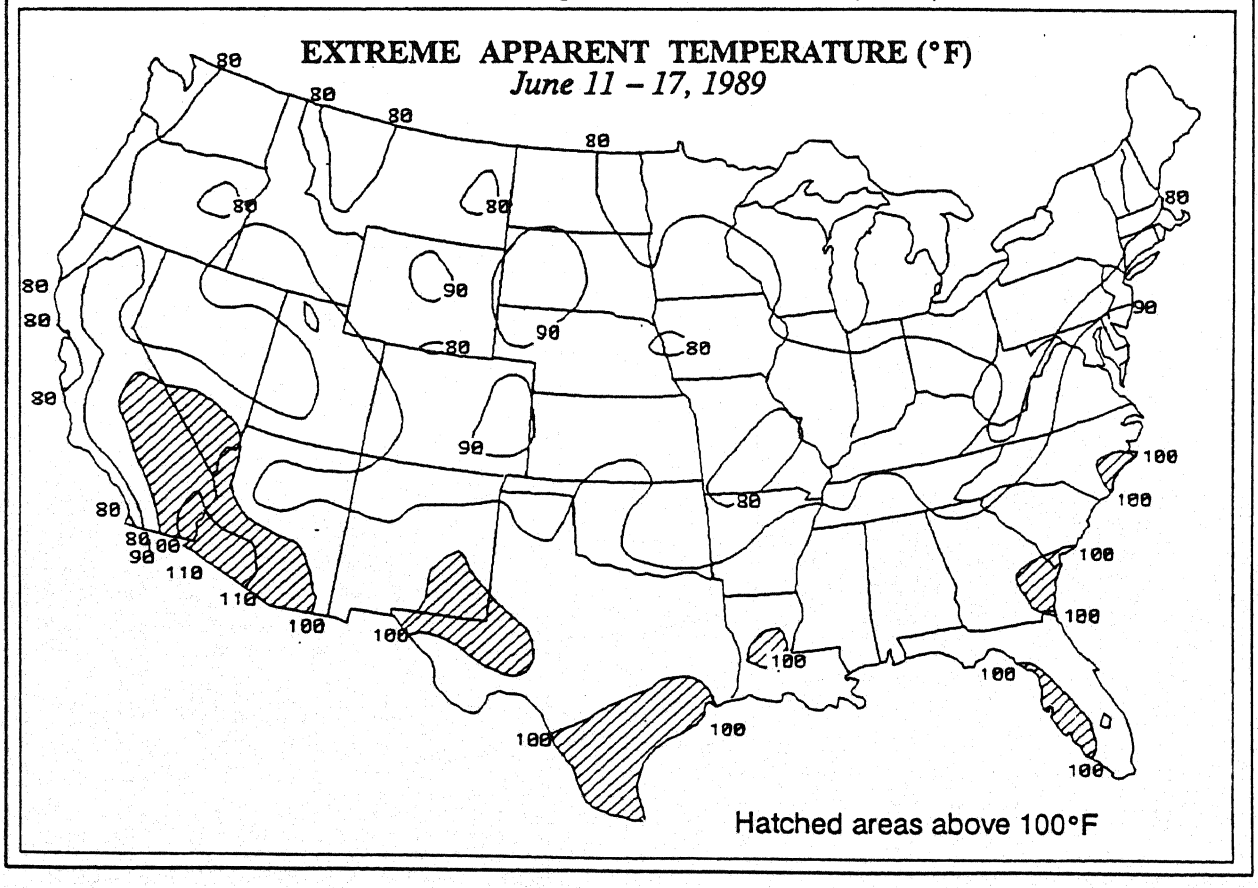
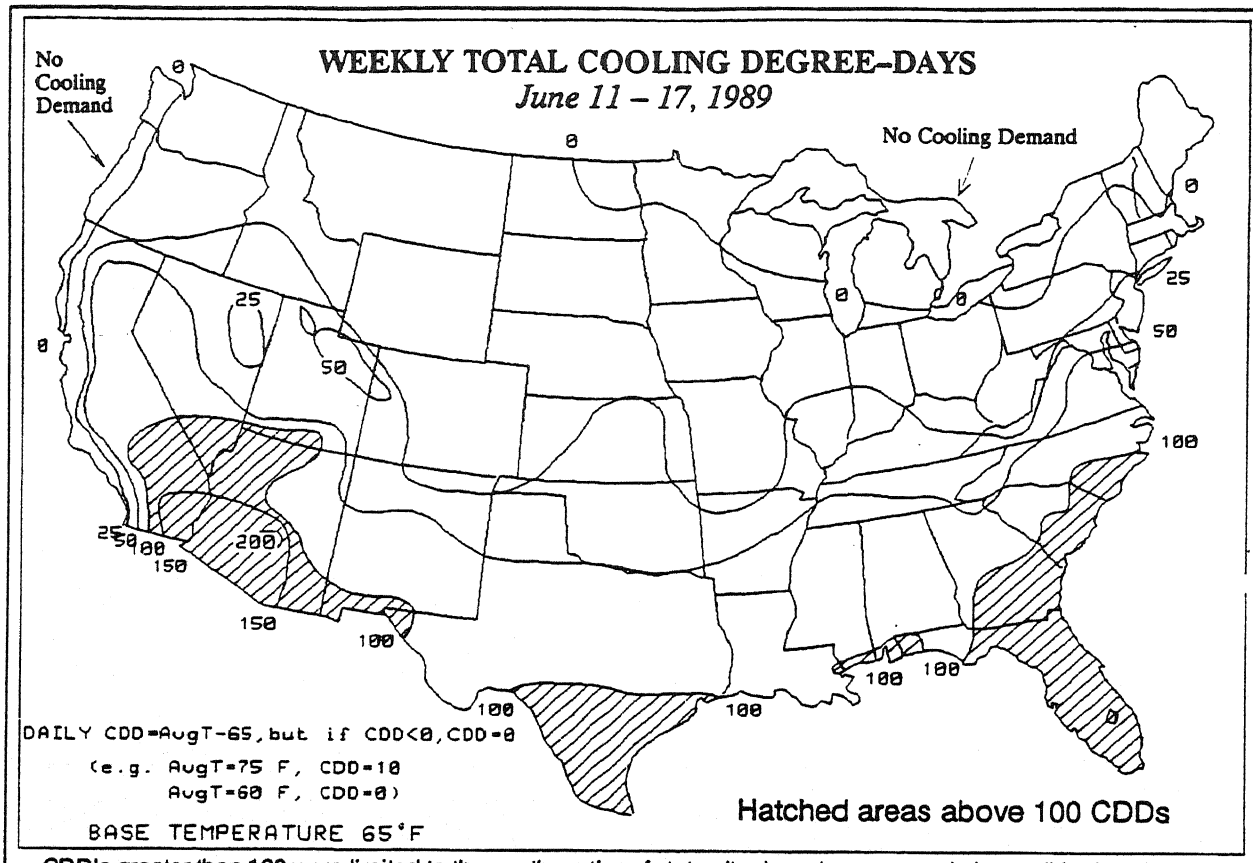


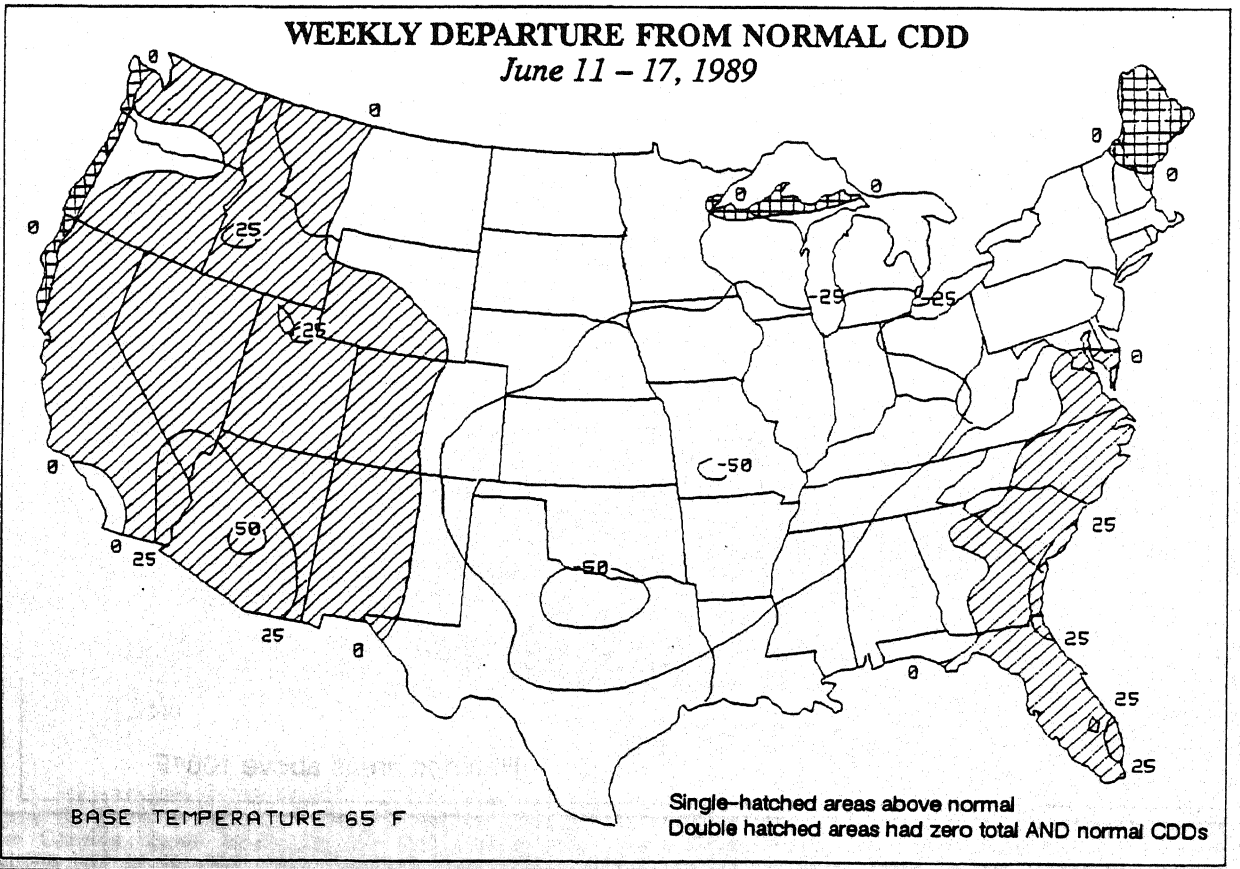
Figure 1

Temperatures soared into the nineties across most of the western and southern thirds of the country while stations in the desert Southwest exceeded 110°F (top). Dangerous apparent temperatures were observed along parts of the Gulf and southern Atlantic Coasts and throughout the desert Southwest (bottom).





CDD's greater than 100 were limited to the southern tier of states (top) as above normal air conditioning demand occurred along the southern half of the Atlantic coast and in the western third of the U.S. while cooler air lowered the CDD demand throughout the nation's midsection (bottom).



COMPARISON OF 1989 VERSUS 1988 PRECIPITATION PERCENT AND DEPARTURE FROM NORMAL DURING APRIL 1-JUNE 17.

Approximately one year ago, many parts of the contiguous U.S. were experiencing severe drought. Most of the northern Great Plains, Midwest, lower Mississippi Valley, and Gulf Coast had observed less than half the normal precipitation since April 1, 1988 during the critical planting and early growing season (see Figure 1). Subnormal precipitation had also fallen on New England and along the south Atlantic Coast. In the upper Midwest, northern Great Plains, and New England, 3 inch deficits were common, while farther south, deficiencies of 6 to 12 inches had accumulated in the middle and lower Mississippi Valleys and along the Gulf Coast (see Figure 2). In contrast, southern Florida, the mid-Atlantic, and most of the West recorded near to above normal precipitation, although surplus amounts were generally less than 3 inches.

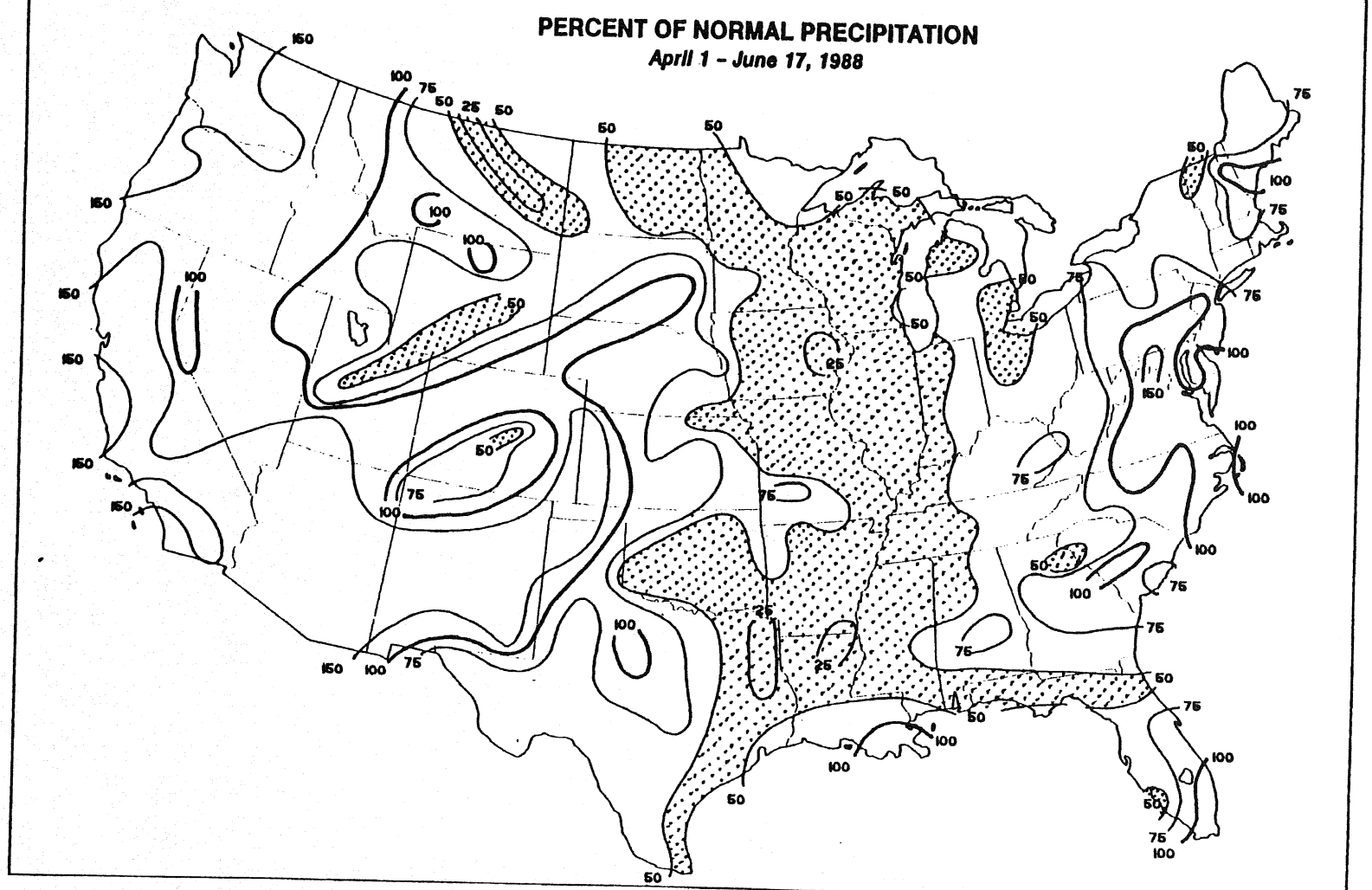


Figure 1. Percent of normal precipitation during April 1 – June 17, 1988. Stippled areas are less than 50%, and the enhanced contour = 100%. Contours are only drawn for 25, 50, 75, 100, and 150%.

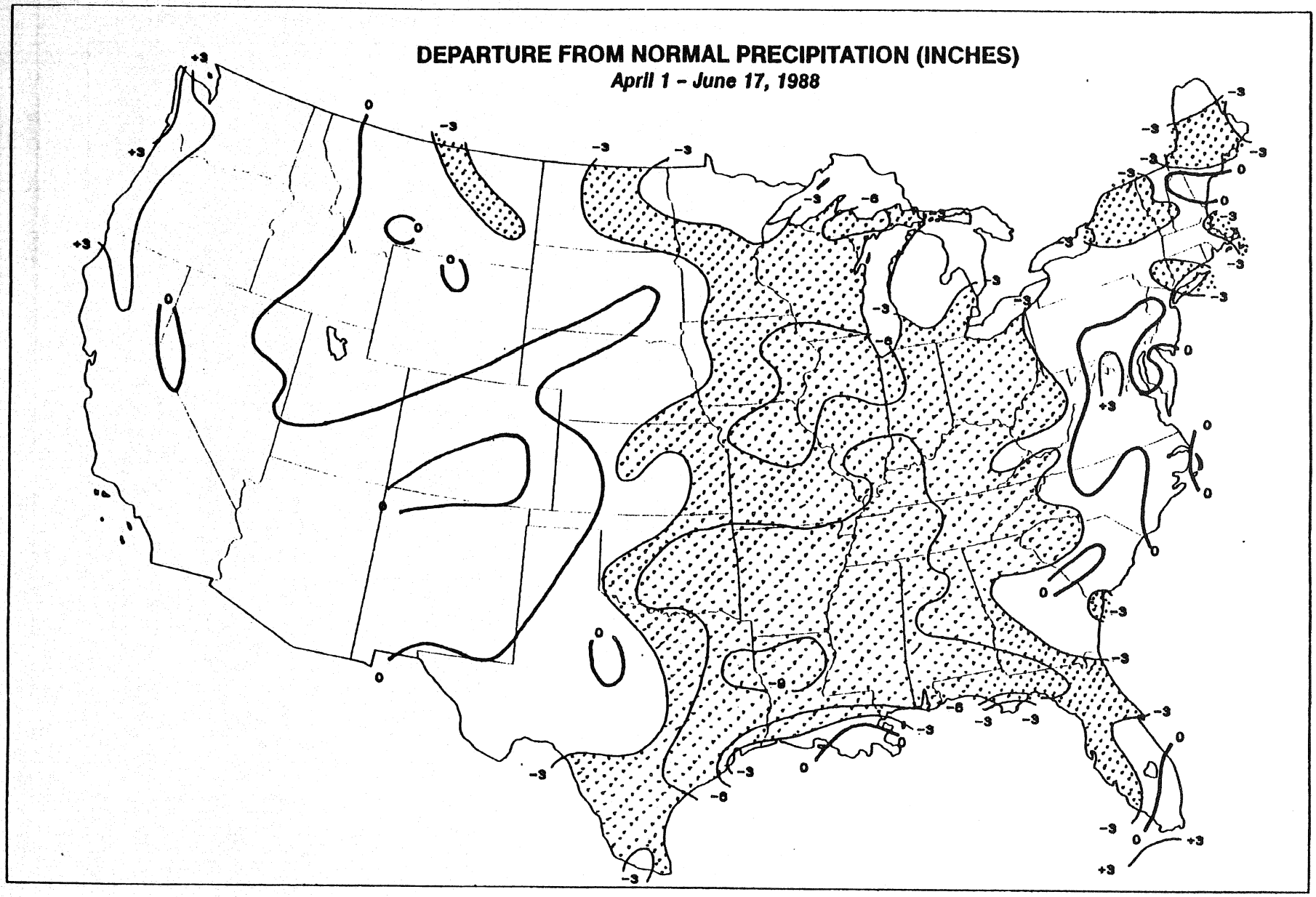


Figure 2. Departure from normal precipitation (inches) during April 1 – June 17, 1988. Stippled areas are less than-3 inches, and the enhanced contour = 0. Contours are only drawn for –6, –3, 0, +3, and +6 inches.

Since April 1 of this year, precipitation patterns in the lower 48 states are almost the reverse of last year's spring patterns. Most of the eastern half of the country has received near to excessive precipitation, especially along the Atlantic and eastern Gulf Coasts, in the Ohio, Tennessee, and lower Mississippi Valleys, and the south-central Great Plains (see Figure 3). Even though most of the northern Rockies, northern Great Plains, and upper Midwest have observed subnormal precipitation since April 1, ample moisture from winter storms have eased long-term dryness in these regions. Surpluses exceeding 6 inches are widespread in the South and East (see Figure 4). In the western Corn Belt, however, long-term dryness left over from last year's drought persisted through the winter and have recently been accentuated by subnormal precipitation since April 1.

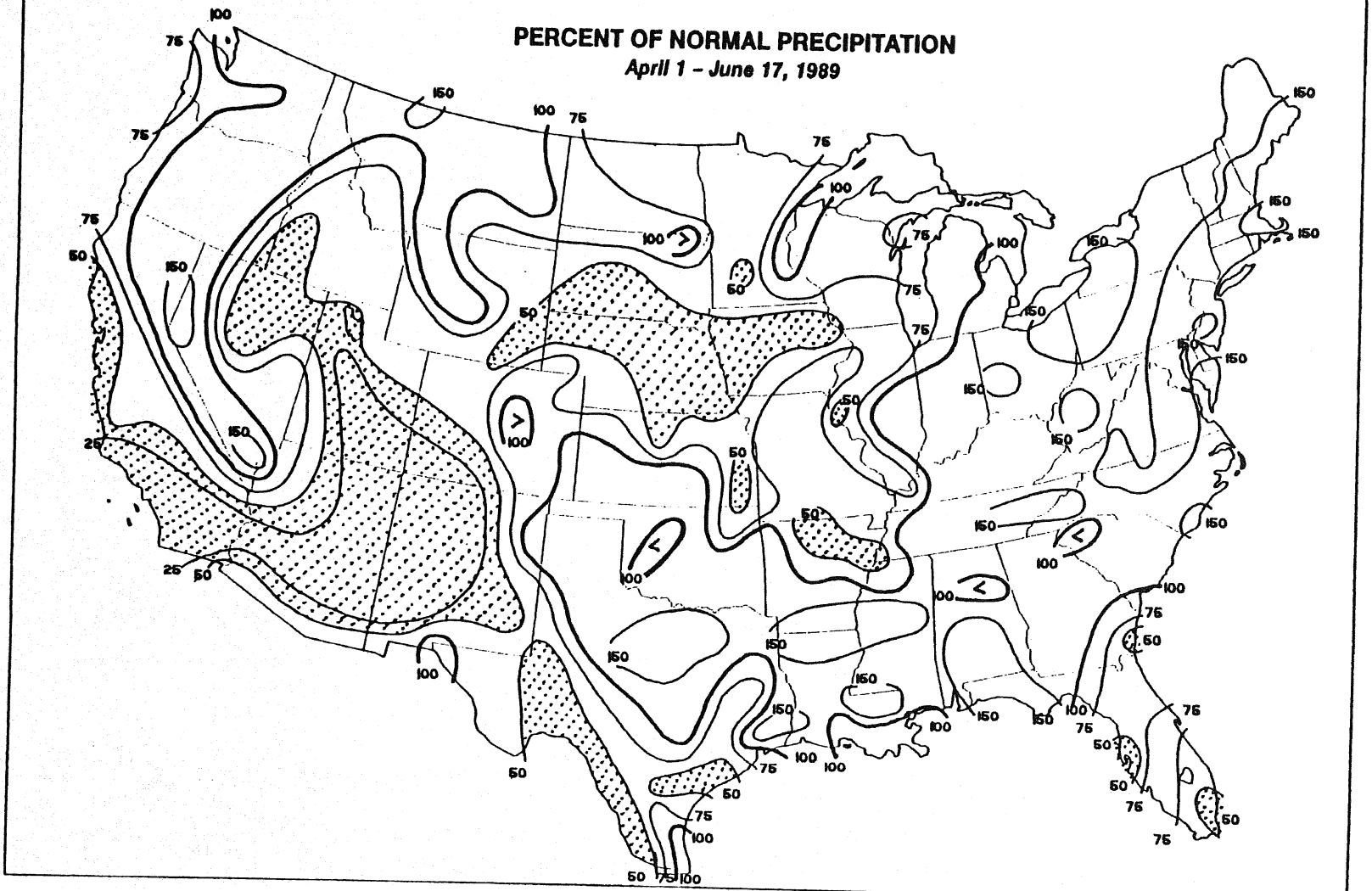


Figure 3. Percent of normal precipitation during April 1 – June 17, 1989. Stippled areas are less than 50%, and the enhanced contour = 100%. Contours are only drawn for 25, 50, 75, 100, and 150%.

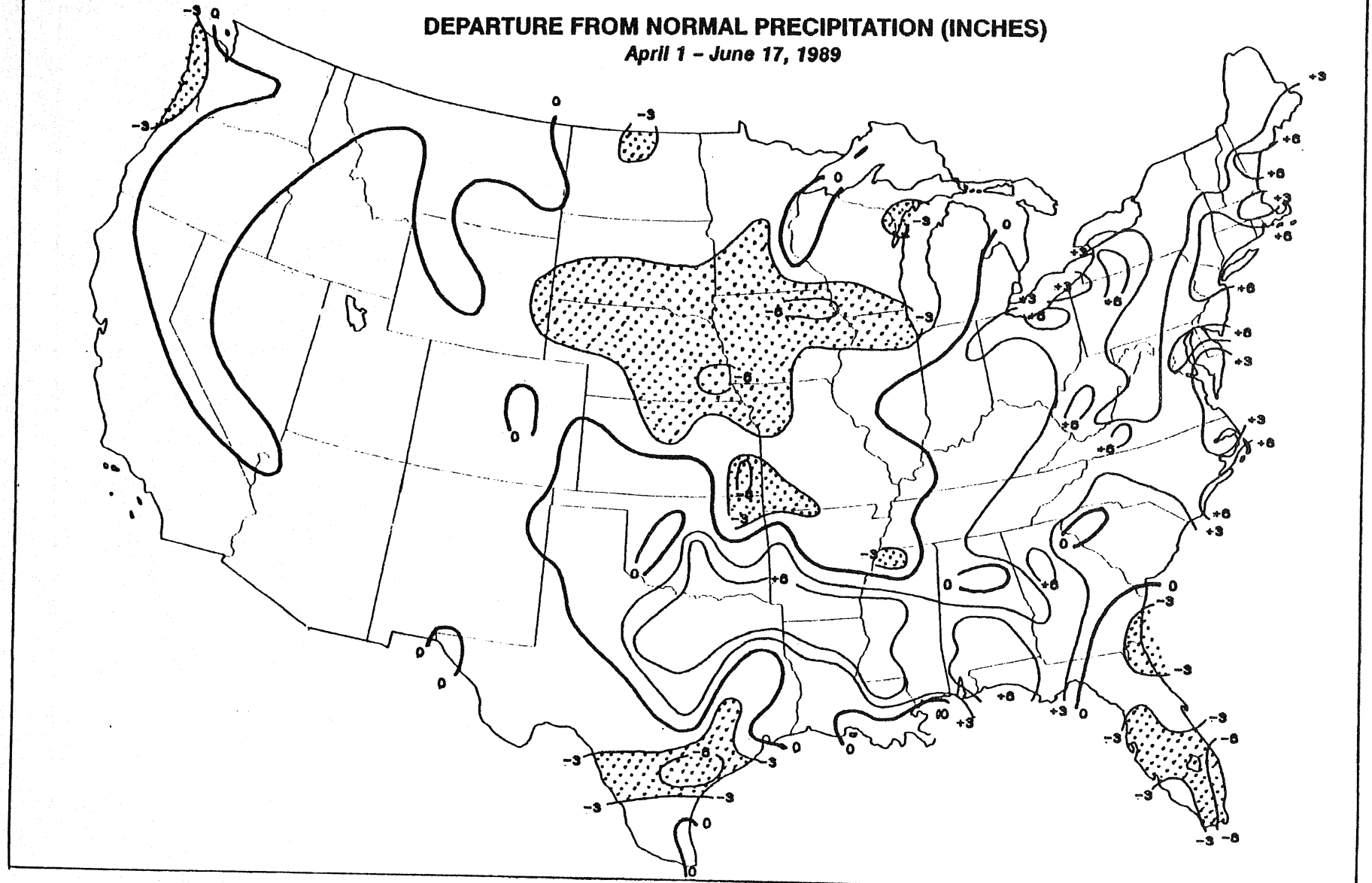
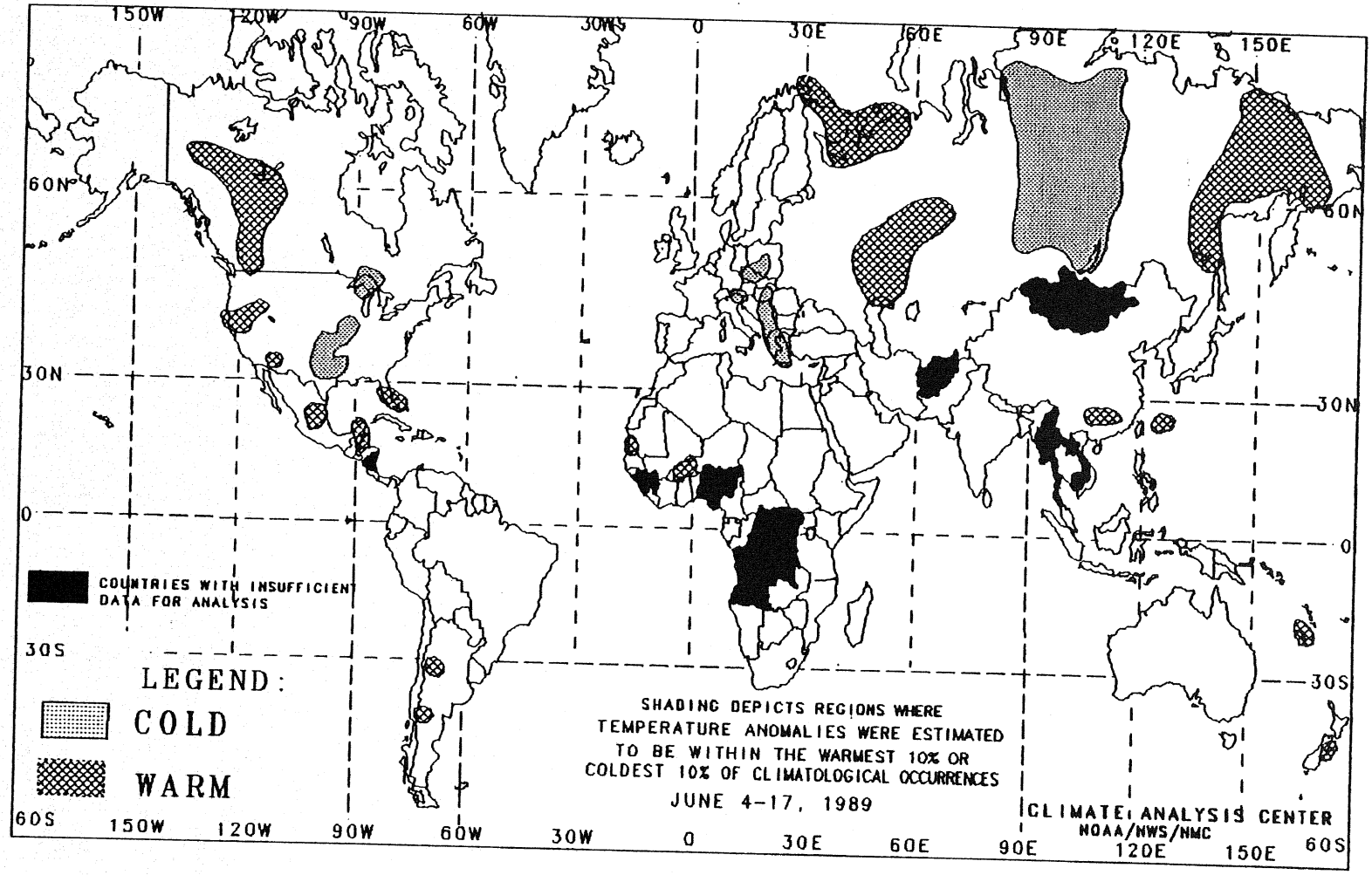


Figure 4. Departure from normal precipitation (inches) during April 1 – June 17, 1989. Stippled areas are less than -3 inches, and the enhanced contour = 0. Contours are only drawn for –6, –3, 0, +3, and +6 inches.

GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

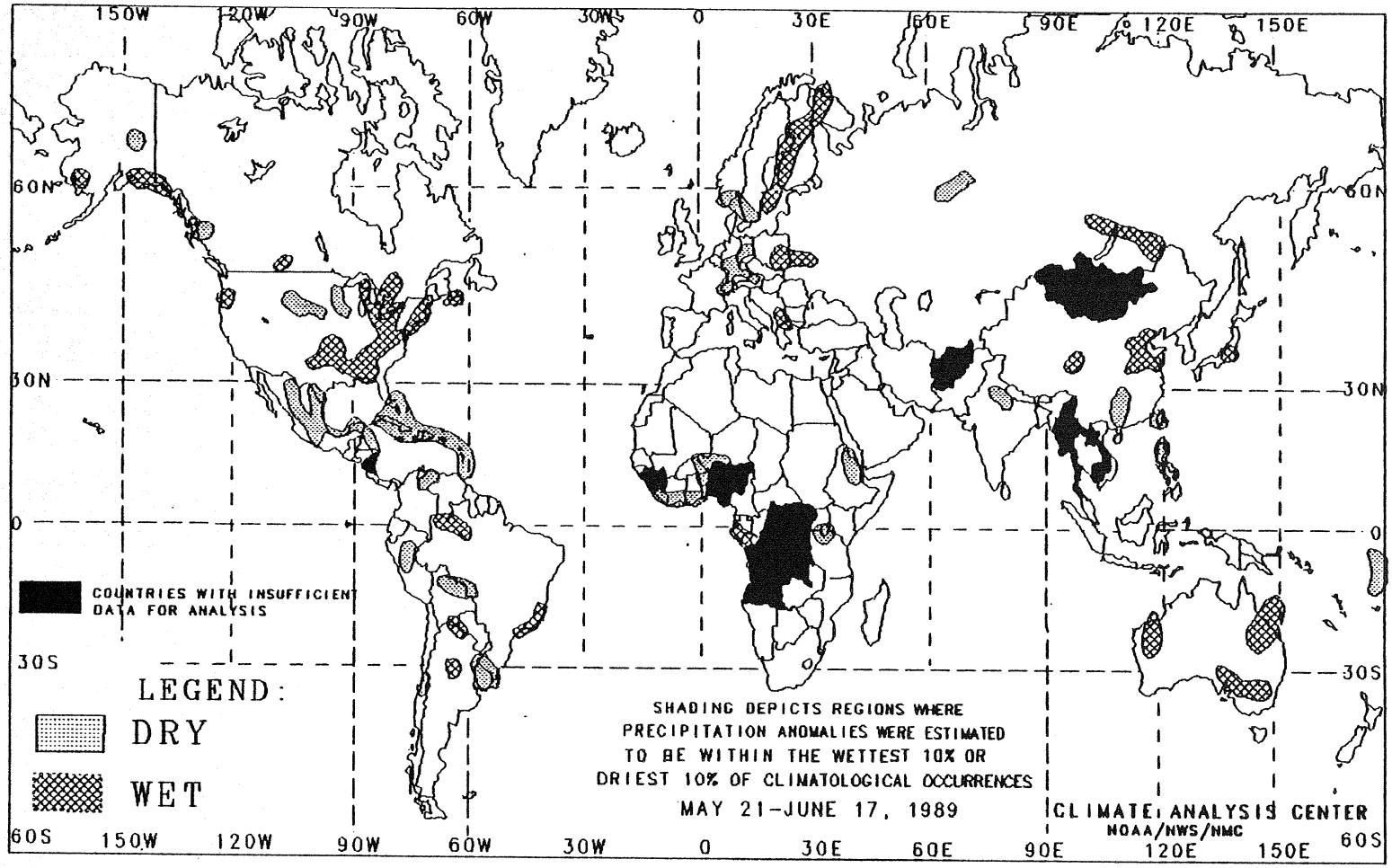
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were recieved or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

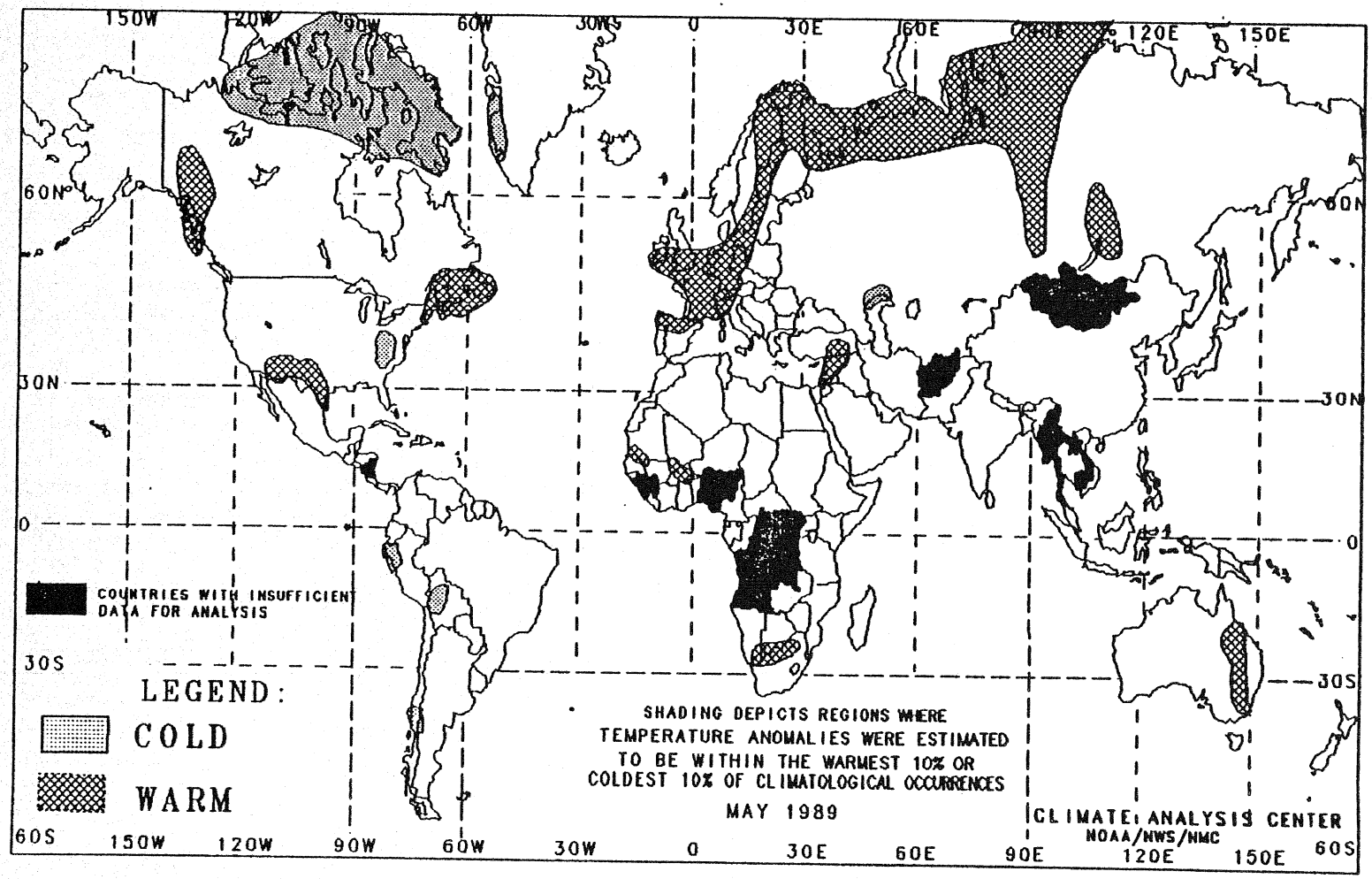
In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South Africa, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week predipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL TEMPERATURE ANOMALIES

1 MONTH



The anomalies on this chart are based on approximately 2500 observing stations for which at least 26 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of one month temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

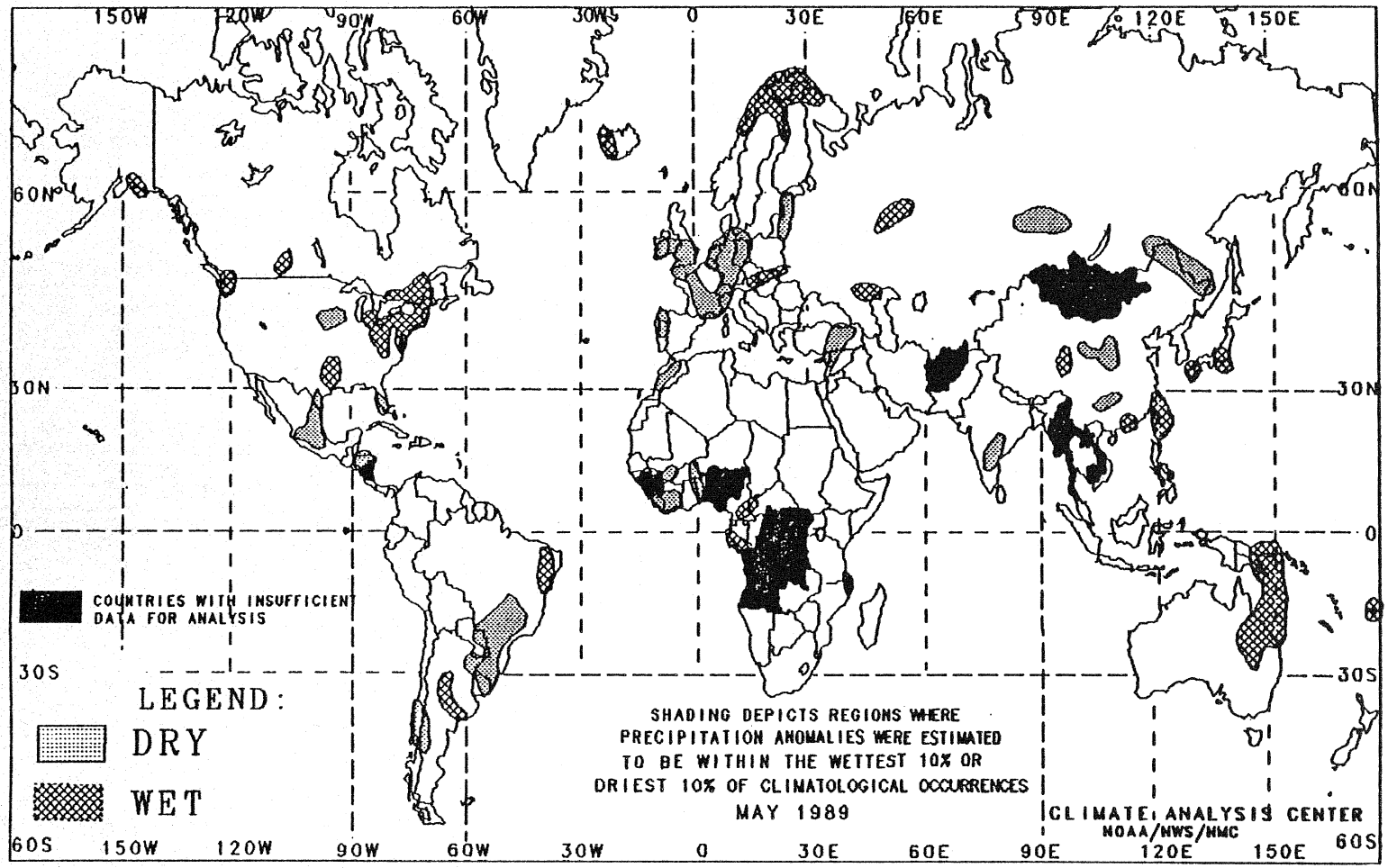
PRINCIPAL TEMPERATURE ANOMALIES

MAY 1989

;IONS AFFECTED	TEMPERATURE AVERAGE (C)	DEPARTURE FROM NORMAL (C)	COMMENTS
NORTH AMERICA			
Southeastern Alaska and West Central Canada	+8 to +11	+2 to +3	MILD - 2 to 16 weeks
Northern Canada	-15 to -8	-3 to -9	COLD - 5 to 6 weeks
South Central United States	+17 to +28	+2 to +3	WARM - 2 to 16 weeks
East Central United States	+14 to +18	-2 to -3	Very cold first half of May
Northeastern United States and Southeastern Canada	+6 to +15	+2 to +4	WARM - 5 to 9 weeks
SOUTH AMERICA AND EASTERN PACIFIC			
Western Peru	+17 to +22	-2 to -3	Very cool first half of May
West Central Bolivia	+6 to +24	-2 to -3	COOL - 5 weeks
Central Chile and Adjacent Argentina	+4 to +9	Around -2	Very cold first half of May
EUROPE AND THE MIDDLE EAST			
Greenland	-3 to -1	-2 to -3	Very cold first half of May
Northern and Western Europe	+2 to +19	+2 to +6	WARM - 2 to 30 weeks
Turkey and the Middle East	+18 to +26	+2 to +4	WARM - 2 to 4 weeks
AFRICA			
Senegal and Adjacent Mauritania	+30 to +36	Around +2	WARM - 6 weeks
Mali and Burkina Faso	+31 to +35	Around +2	Very warm second half of May
South Africa and Adjacent Namibia	+14 to +18	+2 to +3	Very warm second half of May
ASIA			
Western Kazakh S.S.R.	+16 to +17	Around -3	Very cold second half of May
Northwestern Siberia	-5 to +12	+2 to +6	WARM - 2 to 5 weeks
South Central Siberia	+6 to +8	+2 to +3	WARM - 2 to 38 weeks
AUSTRALIA AND WESTERN PACIFIC			
Eastern Australia	+11 to +24	+2 to +3	WARM - 2 to 7 weeks

GLOBAL PRECIPITATION ANOMALIES

1 MONTH



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were recieved or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the one month period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total one

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South Africa, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of one month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

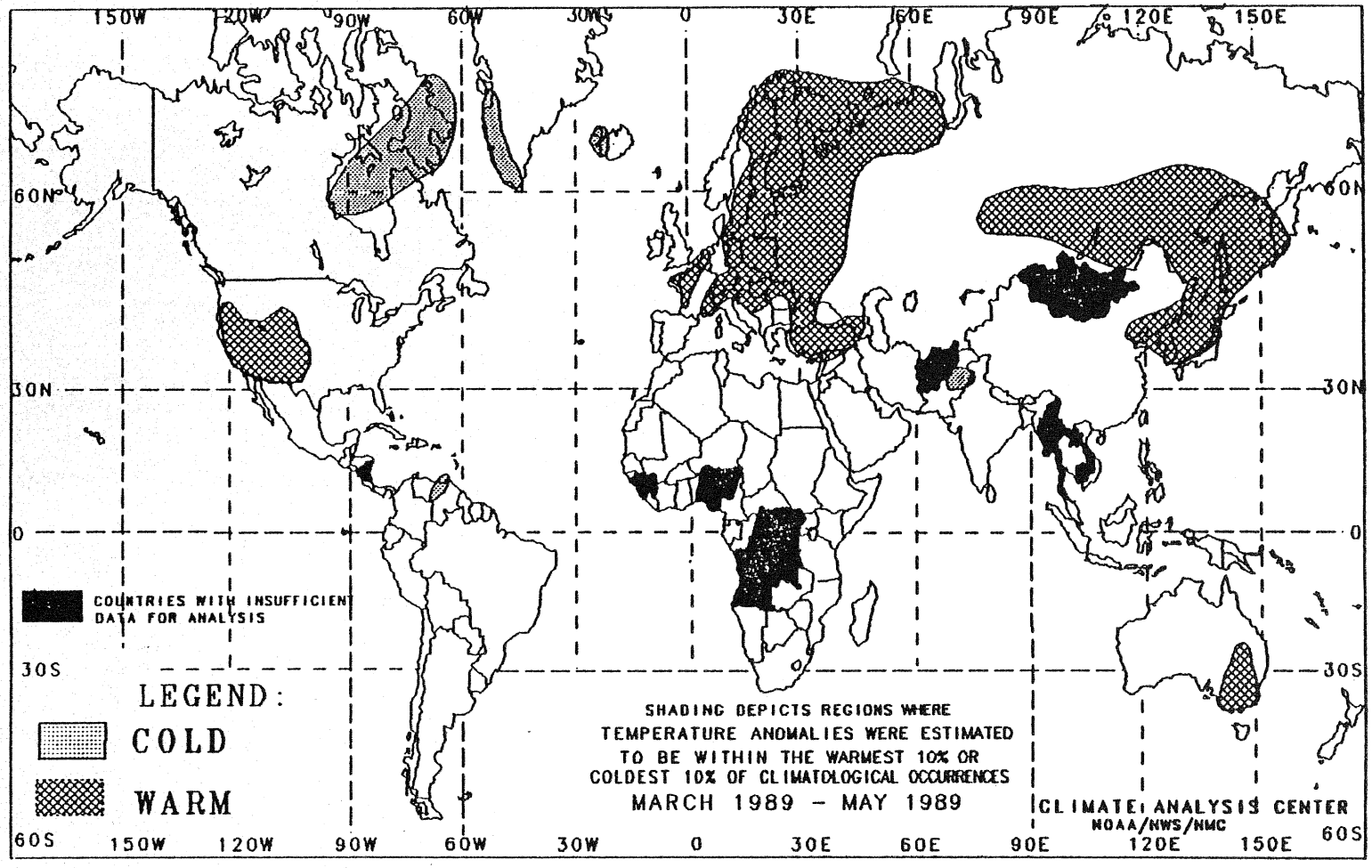
PRINCIPAL PRECIPITATION ANOMALIES

MAY 1989

REGIONS AFFECTED	PRECIPITATION TOTAL (MM)	PERCENT OF NORMAL	COMMENTS
NORTH AMERICA			
South Central Alaska	149 to 290	185 to 196	WET - 2 to 4 weeks
Southwestern Saskatchewan	65 to 94	210 to 238	WET - 5 to 6 weeks
Western Washington and Adjacent British Columbia	51 to 147	156 to 198	Heavy precipitation second half of May
Iowa and Nebraska	14 to 92	13 to 46	DRY - 5 weeks
Northeastern United States and Adjacent Canada	103 to 349	146 to 358	WET - 2 to 6 weeks
South Central United States	237 to 344	198 to 284	WET - 4 to 5 weeks
Southern Florida	6 to 50	7 to 44	DRY - 10 weeks
Mexico and Southern Texas	0 to 42	0 to 63	DRY - 7 to 10 weeks
Honduras	14 to 65	14 to 35	DRY - 10 weeks
SOUTH AMERICA AND EASTERN PACIFIC			
Eastern Brazil	309 to 651	212 to 251	WET - 4 weeks
Southern Brazil and Adjacent Paraguay, Uruguay, and Argentina	0 to 102	0 to 65	DRY - 5 to 10 weeks
East Central Argentina	7 to 14	9 to 20	DRY - 4 weeks
Central Argentina	31 to 136	134 to 557	Heavy precipitation first half of May
Chile and Adjacent Argentina	7 to 87	5 to 23	DRY - 8 to 14 weeks
EUROPE AND THE MIDDLE EAST			
Western Iceland	78 to 136	223 to 315	Heavy precipitation second half of May
Northern Scandinavia	37 to 128	121 to 295	WET - 7 to 9 weeks
West Central Europe	0 to 60	0 to 59	DRY - 4 to 10 weeks
Spain and Portugal	23 to 65	33 to 50	DRY - 6 weeks
East Central Europe	57 to 146	121 to 267	Heavy precipitation first half of May
West Central European Soviet Union	8 to 20	21 to 41	DRY - 5 to 9 weeks
East Central European Soviet Union	76 to 123	177 to 299	WET - 8 weeks
Southeastern European Soviet Union	52 to 121	300 to 347	Heavy precipitation first half of May
Eastern Turkey and Adjacent Syria	0 to 40	0 to 44	DRY - 7 to 14 weeks
AFRICA			
Morocco	0 to 21	0 to 10	DRY - 8 weeks
Southwestern Mali	0 to 48	0 to 64	DRY - 4 to 10 weeks
Coasts of Liberia and Ivory Coast	47 to 101	31 to 60	DRY - 4 to 10 weeks
Togo, Benin, and Burkina Faso	0 to 64	0 to 43	DRY - 4 to 14 weeks
Cameroon and Central African Republic	134 to 347	145 to 175	Heavy precipitation first half of May
Gabon and Congo	244 to 506	241 to 333	WET - 2 to 8 weeks
Northeastern Mozambique and Southeastern Tanzania	162 to 171	320 to 664	WET - 7 weeks
ASIA			
Southwestern Siberia	12 to 19	10 to 44	DRY - 5 to 6 weeks
Southeastern Siberia and Manchuria	4 to 49	10 to 67	DRY - 6 to 13 weeks
West Central China	51 to 94	179 to 229	Heavy precipitation second half of May
North Central China	3 to 21	8 to 46	DRY - 5 weeks
Southwestern China	79 to 143	41 to 75	DRY - 5 to 10 weeks
South Central China	570 to 772	221 to 254	WET - 2 to 3 weeks
Southeastern China, Taiwan, and Ryukyu Islands	230 to 432	122 to 292	WET - 2 to 4 weeks
Western Japan	152 to 367	128 to 254	WET - 6 weeks
Central Japan	120 to 456	127 to 359	WET - 5 to 12 weeks
Central India	0 to 15	0 to 27	DRY - 10 weeks
AUSTRALIA AND WESTERN PACIFIC			
Eastern Australia, Papua New Guinea, and Eastern Indonesia	104 to 574	155 to 666	WET - 6 to 14 weeks
Fiji Islands	163 to 448	129 to 386	Heavy precipitation early and late in May

GLOBAL TEMPERATURE ANOMALIES

3 MONTHS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 78 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

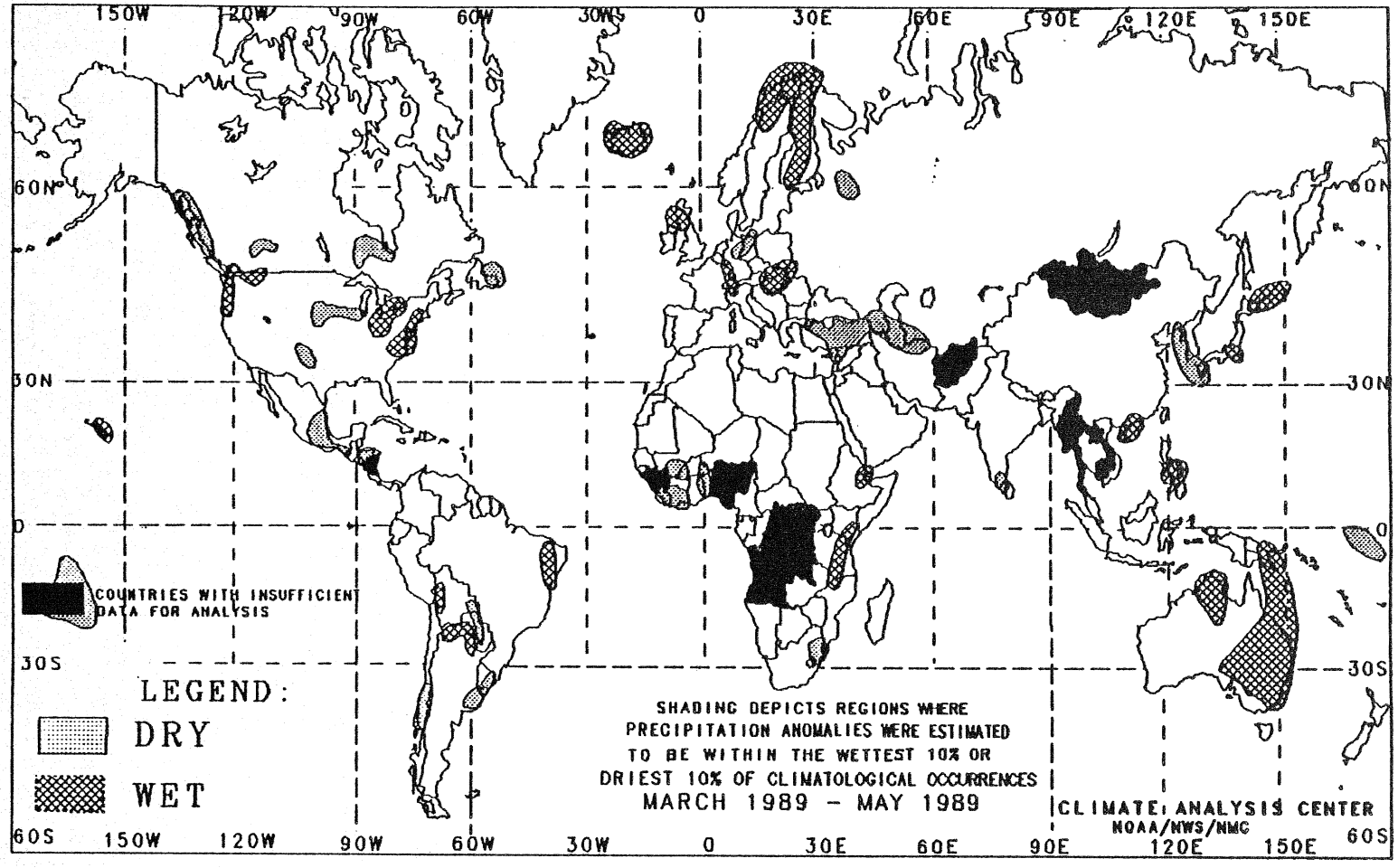
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of three month temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

3 MONTHS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 81 days of precipitation observations (including zero amounts) were recieved or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

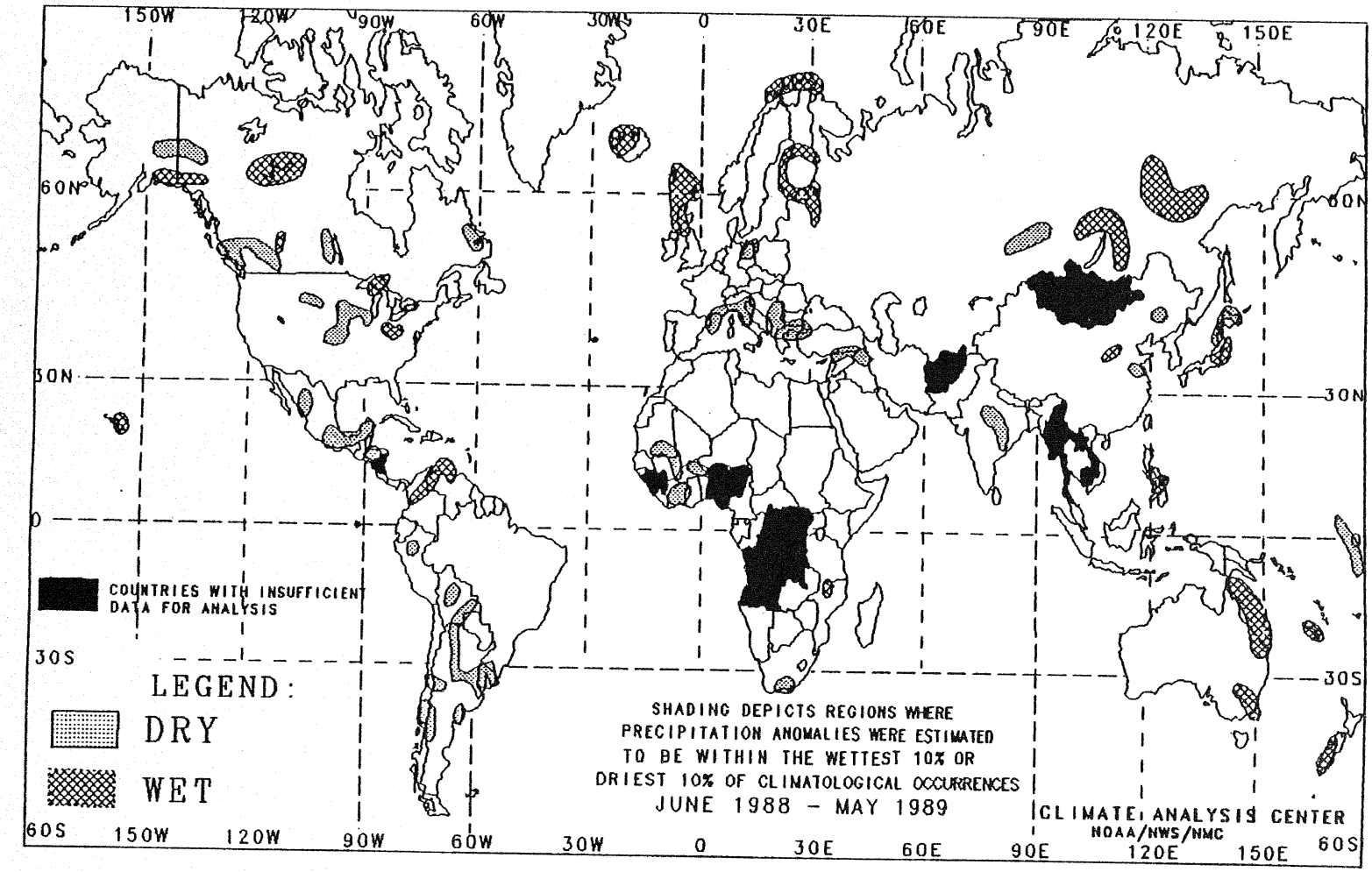
In climatologically arid regions where normal precipitation for the three month period is less than 50 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total three month precipitation exceeds 125 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South Africa, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of three month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

12 MONTHS



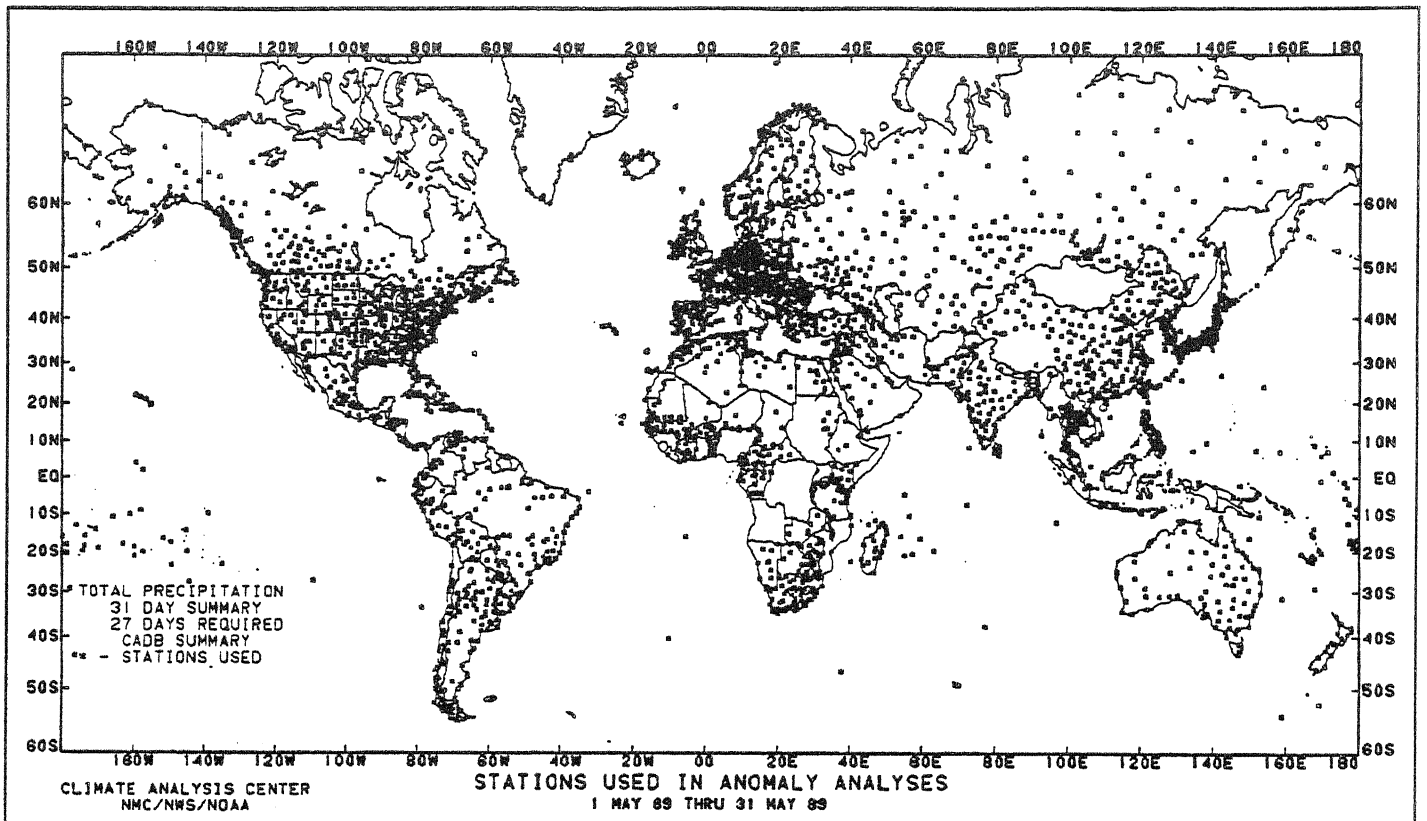
The anomalies on this chart are based on approximately 2500 observing stations for which at least 350 days of precipitation observations (including zero amounts) were recieved or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the twelve month period is less than 100 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total twelve month precipitation exceeds 250 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South Africa, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of twelve month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

STATIONS USED IN THE MONTHLY ANOMALY ANALYSES (MAY 1989)



Stations used in the anomaly analyses for total precipitation (top) and average temperatures (bottom) during May 1989. 27 (26) or more days were required for inclusion in the monthly total precipitation (average) temperature anomaly analyses. There were no data receipts for some countries in Africa, the Middle East, and Southeast Asia.